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Summary

About this Release

This paper describes a model based approach to producing small area estimates of counts for different categories of the Australian labour force based on a multinomial logit mixed model with category specific random effects. By category-specific we mean that within each small area there are two correlated random effects, one associated with the employed category and the other associated with the unemployed category. Estimates of the model parameters are produced using penalized quasi-likelihood combined with approximated restricted maximum likelihood estimation and using these, estimated counts are then produced for each small area. Mean squared error estimates of the estimated counts are approximated using two methods: 1) a parametric bootstrap and 2) analytical approximations, and we compare the performance of both. Using a parametric bootstrap we also examine the properties of the combined penalized quasi-likelihood and restricted maximum likelihood estimators and discuss model goodness of fit measures and diagnostics.

Keywords: small area estimation, multinomial logit mixed model, parametric bootstrap, labour force survey.

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